

7. $125^{-x} = 25^{3x}$ $(5^3)^{-x} = (5^2)^{3x}$ $5^{-3x} = 5^{6x}$ $-3x = 6x$
 $0 = 9x$
 $0 = x$
 $x = 0$

8. $216^{3-x} = 36^x$ $(6^3)^{3-x} = (6^2)^x$ $6^{9-3x} = 6^{2x}$ $9-3x = 2x$
 $9 = 5x$
 $\frac{9}{5} = x$

9. $\left(\frac{1}{2}\right)^{-x} = \left(\frac{1}{4}\right)^{x+1}$ $(2^{-1})^{-x} = (2^{-2})^{x+1}$ $2^x = (2^{-2})^{x+1}$ $2^x = 2^{-2x-2}$
 $x = -2x-2$ $3x = -2$ $x = -\frac{2}{3}$

10. $8^{\frac{1}{2}x} = 32^{\frac{1}{3}x + \frac{1}{5}}$ $(2^3)^{\frac{1}{2}x} = (2^5)^{\frac{1}{3}x + \frac{1}{5}}$ $2^{\frac{3}{2}x} = 2^{\frac{5}{3}x + 1}$
 $\frac{3}{2}x = \frac{5}{3}x + 1$ $\frac{3}{2}x - \frac{5}{3}x = 1$ $\frac{9}{6}x - \frac{10}{6}x = 1$ $-\frac{x}{6} = 1$ $x = -6$

11. $\frac{2^{x^2}}{2^x} = 16^{\frac{3}{2}}$ $2^{x^2-x} = (2^4)^{\frac{3}{2}}$ $2^{x^2-x} = 2^6$ $x^2-x = 6$
 $x^2-x-6 = 0$ $(x-3)(x+2) = 0$ $x = 3$ or $x = -2$

12. True or False: $27^4 = 3^{12}$ $(3^3)^4 = 3^{12}$ $3^{12} = 3^{12}$ True

13. True or False: $64^4 = 16^6$ $(4^3)^4 = (4^2)^6$ $4^{12} = 4^{12}$ True